

LQXB08 Test Report

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Quench Training

In the first test cycle, MQXB13 quenched at 12817 A (231 T/m^1). As MQXB03 had already been quench trained, it was ramped to 12208 (220 T/m) and back down when connected in series with MQXB13.

Quench training results are compared to previous magnets in Fig. 1. Table 1 is a list of quenches executed as part of quench current studies. At the end of the test program additional quenches were done at 4.5 K to study the ramp rated dependence of the quench current for BTEV.

Summary: The requirements for acceptance are satisfied.

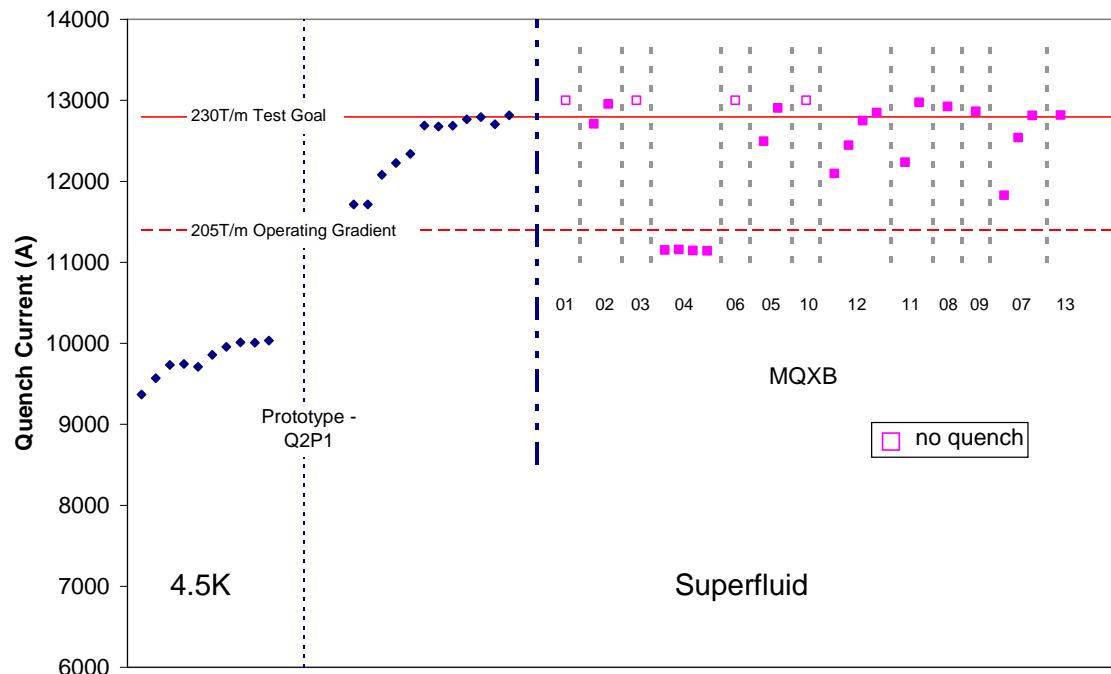


Figure 1: LQXB08 quench training. The horizontal dashed and solid lines correspond to 205 and 230 T/m field gradient respectively.

¹Gradiant quoted is body gradiant based on HGQ09 body transfer function measurements.

Table 1: List of quenches

date	time	test cycle	current (A)	ramp rate (A/s)	location	gradient (T/m) ²
<i>MQXB13</i>						
1/27/2005	1620	1	12817	20	Q1	231
<i>MQXB03</i>						
1/31/2005	1508	1	12208	20	n.a.	220
after series testing						
<i>MQXB13</i>						
2/3/2005	1105	1	7922	300	Q4	145*
2/3/2005	1226	1	9157	200	Q4	167*
2/3/2005	1320	1	9754	160	Q1	177*
2/3/2005	1447	1	10211	20	Q1	185*

*These tests were done at ~4.5K. The others are at 1.9-2.0K.

Magnetic Field Quality Measurements

Field quality measurements were made with rotating coils. Integral field measurements were made with a multi-sectioned probe of 3 sections matched to the pitch length of the inner coil with one pitch length between sections. Complete longitudinal scans were made with a probe of length 0.82 m. The program consisted of the following measurement types.

- A “DC loop” in which the magnet was ramped in a series of steps with the field characterized at DC field at each level on the up and down ramp which we use to establish both the upramp and the geometric component of the harmonic. This is done with the integral probe. No such measurement was made as they are redundant with the longitudinal scans with the short probe.
- A prototypical accelerator cycle in which the field was measured during a conditioning pre-cycle to full field followed by a ramp down, a stop at an extended injection porch with a ramp to full field afterwards. This serves to characterize the field at injection including decay and snapback effects. These are typical done with the integral probe; however in these 2 magnets we did cycles with the short probe in the magnet body and in the magnet ends.
- Continuous measurements during a series of ramps to full field and back at different ramp rates to check for eddy current effects. These are done with the integral probe. (Note that the aforementioned accelerator cycle is a 10 A/s loop; 40 and 80 A/s loops were also done.)
- A DC loop with a longitudinal scan at each stopping point. This allows body-end field separation. These scans may be integrated to provide a characterization of the entire magnet.

² This is the equivalent body gradient based on HGQ09 measurements. The [linear fit parameters](#) to the high current transfer function are slope 0.0174 and intercept 7.34.

- A cleansing quench preceded the accelerator cycle measurement with the integral probe.

A list of the measurements made is given in Appendix A. Data is posted at the following URL.

http://wwwtsmtf.fnal.gov/~dimarco/usrAnalysisLQX/web_summaries/LQXB08/magneticMeasurements/LQXB08_mag_meas.html

Tables 2-4 summarize the field quality measurements with respect to the harmonics acceptance criteria³ for the magnet.

Table 2: Integral Field Harmonics for LQXB08

LQXB08			
	669 A (12.3 T/m)	11345 A (205 T/m)	Unit
TF	0.20230	0.19843	T/A
ML	10.972	10.982	m
FD	0	0	mrad
b3	0.36	0.32	units
b4	0.15	0.16	units
b5	0.13	0.13	units
b6	-1.88	-0.05	units
b7	0.02	0.02	units
b8	-0.01	-0.01	units
b9	0.01	-0.01	units
b10	0.06	0.02	units
a3	-0.58	-0.51	units
a4	-0.07	-0.16	units
a5	-0.02	0.00	units
a6	-0.03	-0.01	units
a7	-0.06	-0.05	units
a8	-0.02	-0.01	units
a9	0.01	0.00	units
a10	0.00	0.02	units

³ Acceptance criteria for harmonics are from v7 of the acceptance document. [Acceptance bands](#) are from v3.2 of the reference harmonics table. The method for calculation of integral harmonics is given in Appendix D.

Table 3: Integral Field Harmonics for MQXB03

	MQXB03		
	669 A (12.3 T/m)	11345 A (205 T/m)	Unit
TF	n.a.	n.a.	T/A
ML	5.487	5.493	m
FD	0	0	mrad
b03	-0.57	-0.48	units
b04	0.13	0.18	units
b05	-0.09	-0.04	units
b06	-2.35	-0.40	units
b07	0.02	0.00	units
b08	0.00	-0.01	units
b09	-0.02	0.01	units
b10	0.06	0.02	units
a03	0.64	0.69	units
a04	-0.47	-0.25	units
a05	0.22	0.20	units
a06	-0.08	-0.11	units
a07	-0.02	-0.01	units
a08	-0.02	-0.01	units
a09	0.02	0.01	units
a10	-0.01	-0.02	units

Table 4: Integral Field Harmonics for MQXB13

	MQXB13		
	669 A (12.3 T/m)	11345 A (205 T/m)	Unit
TF	n.a.	n.a.	T/A
ML	5.485	5.489	m
FD	0	0	mrad
b03	0.15	0.16	units
b04	0.16	0.15	units
b05	0.16	0.23	units
b06	-1.42	0.31	units
b07	0.06	0.05	units
b08	-0.02	-0.01	units
b09	0.00	-0.01	units
b10	0.06	0.02	units
a03	-1.80	-1.72	units
a04	-0.61	-0.58	units
a05	-0.27	-0.20	units
a06	-0.14	-0.13	units
a07	-0.11	-0.09	units
a08	-0.06	-0.02	units
a09	-0.01	-0.01	units
a10	0.00	0.01	units

Summary: Field quality is good. Most harmonics are within one sigma of the target.

End field data of the z scan of MQXB13 taken at 5560 A on the up ramp are inconsistent with the scans at other currents. The return end position is wrong (probably wrongly reported as the position differs by 0.17 m while the transfer function is 0.1% different) and the transfer function at the 4.5 m position (return end) is approximately half of what it should be.

Note that MQXB03 was the last magnet we built before tuning the b₆ and that we have changed how we calculate magnetic lengths. (See Appendix E.)

Magnetic Field Strength Measurements

SSW measured integral field strength with magnets powered in series is given in Table 3. The first 4 entries are taken on the up ramp and the last on the down ramp.

Summary: The strength at 11345 A is outside the acceptance band of 2254.8±5.7 [2249.1:2260.5] by 1.5σ.

Table 5: Field strength vs. current.

	integral gradient transfer function (T/kA)	integral field strength(T)	strength TF @ Rref (T.m/A)
Current (A)	Q2a+Q2b	Q2a+Q2b	Q2a+Q2b
668.1	202.32	135.2	0.00343944
5459.7	200.78	1096.2	0.00341326
11345.2	197.98	2246.1	0.00336566
11922.7	197.54	2355.2	0.00335818
5459.7	200.74	1096.0	0.00341258

Alignment

LQXB08 had alignment measurements at each stage of testing at MTF: dates are summarized in the table below. There were also measurements and lug adjustment during mounting of the magnet prior on 06Jan05 to optimize warm alignment before cold test.

The magnet positions changed significantly during first cool down – particularly Q2b which had large changes in yaw and pitch: 0.4-0.5mrad (about 2-3mm over the length of the magnet). Q2a saw changes in the x, y averages of about 0.3mm. There was also a very large change in the roll angle of about 0.8mrad during initial cool-down, which reversed on warm-up. The cold mass transverse offsets remained generally closer to their cold values on warm-up.

Strength measurements on the combined Q2a+Q2b were performed at 1.9K.

Adjustment of the lugs was performed after cold testing and after the magnet had been moved to ICB. Before and after lug adjustment measurements were made at ICB, and the changes applied to the MTF cold and warmAft data to generate the final cold and warm RST values.

A partial list of the measurements performed is given in Table 6 with a full list in Appendix B.

Table 6: Major alignment data sets

Warm before TC1	20Jan05
Cold TC1	01Feb05
Warm after TC1	17Feb05
Warm after TC1 Lug Adjustments (ICB)	29Apr05

Data are posted at the following URL.

http://wwwtsmtf.fnal.gov/~dimarco/usrAnalysisLQX/LQXB08/SSW/LQXB08_align.html

Relative alignment of the magnet assemblies compared to AP requirements is given in Table 7. The relative alignment of the two assemblies is worse than that seen in LQXB04 and more like LQXB03. The relative roll of the correctors is ok.

A summary plot showing the changes in cold mass positions at various points in testing is shown in Fig. 2. The positions are given relative to the Cold TC1 measurements being on the average axis.

Table 7: Relative alignment of magnet assemblies (cold).

relative alignment of MQX magnets in composite Q2		relative alignment	
		x	y
Q2a/Q2b transverse alignment	500 μm	-2526	-2916
Q2a/Q2b relative roll	1 mrad (rms)	0.00	
Q2a/Q2b relative pitch	0.1 mrad	-0.73	
Q2a/Q2b relative yaw	0.1 mrad	-0.25	
relative alignment of MCBX to Q2			
corrector displacement	500 μm	n.a.	
corrector roll	5 mrad	-	
b1		-	
a1		-	

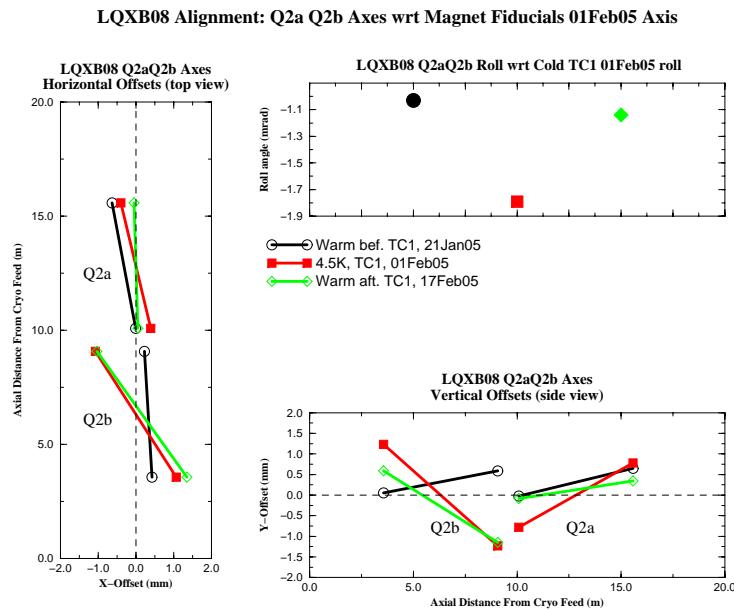


Figure 2: Alignment summary plot.

Summary: Significant changes were seen horizontally and vertically in the cold masses during cool down and the cold masses did not return to their initial positions after the first TC. Lug adjustment was performed afterwards to reduce this. There is a large change in roll during cool down (0.8mrad) which seems reversible.

Other tests performed

Other items of interest

Appendix A: List of field quality measurements

Note that a longitudinal scan of the magnetic field with a rotating coil of the warm collered coil and cold mass were made during production as part of the quality assurance program but are not listed here.

q2a	MQXB03			
size of the unpacked file	date of measurement	file name (unpacked file)	probe (IP=integral; SP=short)	remarks
22033144	Aug 18 2003	q2a_loop10A_s.odb	IP	Integral probe 10 A/s loop
18744104	Aug 18 2003	q2a_loop40A_s.odb	IP	Integral probe 40 A/s loop
10230368	Aug 18 2003	q2a_loop80A_s.odb	IP	Integral probe 80 A/s loop
20136672	Aug 18 2003	q2a_accCycle_3.odb	IP	Integral probe Acc. Profile
8847360	Aug 22 2003	q2a_10211do.odb	SP	Z scan at 10211 A down
8962472	Aug 20 2003	q2a_10211up.odb	SP	Z scan at 10211 A up
8873864	Aug 20 2003	q2a_11063do.odb	SP	Z scan at 11063 A down
9271488	Aug 20 2003	q2a_11063up.odb	SP	Z scan at 11063 A up
8845392	Aug 20 2003	q2a_11922.odb	SP	Z scan at 11922 A
9115136	Aug 20 2003	q2a_5449do.odb	SP	Z scan at 5459 A down
9009344	Aug 20 2003	q2a_5449up.odb	SP	Z scan at 5459 A up
9920080	Aug 20 2003	q2a_669do.odb	SP	Z scan at 669 A down
10402040	Aug 20 2003	q2a_669up.odb	SP	Z scan at 669 A up
q2b	MQXB13			
size of the unpacked file	date of measurement	file name (unpacked file)	probe (IP=integral; SP=short)	remarks
18122376	1/28/2005 15:29	q2b_loop40As.odb	IP	Integral probe 40 A/s loop
10538432	1/28/2005 15:49	q2b_loop80As.odb	IP	Integral probe 80 A/s loop
8528976	1/28/2005 16:06	q2b_accProfile.odb	IP	Integral probe Acc. Profile
25125280	1/28/2005 20:30	q2b_accprofile_short.odb	SP	Short probe Acc. Profile
9224192	1/28/2005 18:27	q2b_11345up.odb	SP	Z scan at 11345 A up
9833440	1/28/2005 18:57	q2b_11922.odb	SP	Z scan at 11922 A
8934200	1/28/2005 19:29	q2b_5459do.odb	SP	Z scan at 5459 A down
9270720	1/28/2005 17:41	q2b_5459up.odb	SP	Z scan at 5459 A up
9299824	1/28/2005 17:14	q2b_669up.odb	SP	Z scan at 669 A up

Appendix B: List of alignment measurements

LQXB08 SSW Measurements Log

(Column 1 is status: R indicates used directly for results; "a" indicates ancillary)

```
=====
/usr/analysis/LQX/LQXB08/SSW/
=====
R 040928_11:32 ICB/initialColdMassAlign_28Sep04/QA/040928_11:32.checkXY_aveOnly
R 040928_11:43 ICB/initialColdMassAlign_28Sep04/QA/040928_11:43.checkXY_onAveAxis
R 040928_12:03 ICB/initialColdMassAlign_28Sep04/QA/040928_12:03.roll
R 040929_09:19
ICB/initialColdMassAlign_28Sep04/QA/040929_09:19.checkXY_onAveAxis_roll_adj1
R 040928_11:15 ICB/initialColdMassAlign_28Sep04/QB/040928_11:15.checkXY_aveOnly
R 040928_12:52 ICB/initialColdMassAlign_28Sep04/QB/040928_12:52.checkXY_aveAxis_roll
R 040928_17:04
ICB/initialColdMassAlign_28Sep04/QB/040928_17:04.checkXY_aveAxis_roll_adj1
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:19.checkZpos
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:24.checkZpos
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:30.checkZpos
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:35.checkZpos
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:41.checkZpos
R 040929_10:19
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R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_10:52.checkZpos
R 040929_10:19
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R 040929_10:19
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R 040929_10:19
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ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_11:30.checkZpos
R 040929_10:19
ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat/040929_11:35.checkZpos
R 040929_10:19 ICB/initialColdMassAlign_28Sep04/QB/040929_10:19.checkZpos_repeat
R 041012_14:44 ICB/initialColdMassAlign_28Sep04/CORRECTORS/041012_14:44.roll
R 041012_15:14 ICB/initialColdMassAlign_28Sep04/CORRECTORS/041012_15:14.v_roll
R 041013_07:27 ICB/initialColdMassAlign_28Sep04/CORRECTORS/041013_07:27.v_roll
R 041013_07:50 ICB/initialColdMassAlign_28Sep04/CORRECTORS/041013_07:50.h_roll
R 041026_10:10 ICB/aferWeld_26Oct04/QB/041026_10:10.centerXY
R 041028_08:48 ICB/aferWeld_26Oct04/QB/041028_08:48.roll
R 041029_10:05 ICB/aferWeld_26Oct04/QB/041029_10:05.ycheck
R 041101_09:49 ICB/aferWeld_26Oct04/QB/041101_09:49.checkXY
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat/041027_09:02.zpos
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat/041027_09:16.zpos
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat/041027_09:31.zpos
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat/041027_09:46.zpos
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat/041027_10:01.zpos
R 041027_09:02 ICB/aferWeld_26Oct04/QB/041027_09:02.zpos_repeat
R 041027_10:32
ICB/aferWeld_26Oct04/QB/041027_10:32.zpos_onQBaxis_repeat/041027_10:32.zpos_onQBaxis
R 041027_10:32
ICB/aferWeld_26Oct04/QB/041027_10:32.zpos_onQBaxis_repeat/041027_10:47.zpos_onQBaxis
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R 041027_10:32
ICB/aferWeld_26Oct04/QB/041027_10:32.zpos_onQBaxis_repeat/041027_11:19.zpos_onQBaxis
R 041027_10:32
ICB/aferWeld_26Oct04/QB/041027_10:32.zpos_onQBaxis_repeat/041027_11:35.zpos_onQBaxis
R 041027_10:32 ICB/aferWeld_26Oct04/QB/041027_10:32.zpos_onQBaxis_repeat
R 041026_11:29 ICB/aferWeld_26Oct04/QA/041026_11:29.checkXY
R 041028_10:06 ICB/aferWeld_26Oct04/QA/041028_10:06.roll
R 041026_13:48 ICB/aferWeld_26Oct04/QA/041026_13:48.zpos_repeat/041026_13:48.zpos
R 041026_13:48 ICB/aferWeld_26Oct04/QA/041026_13:48.zpos_repeat/041026_14:04.zpos
R 041026_13:48 ICB/aferWeld_26Oct04/QA/041026_13:48.zpos_repeat/041026_14:19.zpos
R 041026_13:48 ICB/aferWeld_26Oct04/QA/041026_13:48.zpos_repeat/041026_14:34.zpos
R 041026_13:48 ICB/aferWeld_26Oct04/QA/041026_13:48.zpos_repeat
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R 041026_15:30
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R 041026_15:30
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R 041026_15:30 ICB/aferWeld_26Oct04/QA/041026_15:30.zpos_onQAaxis_repeat
R 041101_11:40 ICB/aferWeld_26Oct04/QA/041101_11:40.checkXY
a 041117_11:33 ICB/onSupports_17Nov04/QA/041117_11:33.checkXY
a 041117_12:01 ICB/onSupports_17Nov04/QA/041117_12:01.roll
a 041117_12:22 ICB/onSupports_17Nov04/QA/041117_12:22.checkY
a 041117_15:27 ICB/onSupports_17Nov04/QA/041117_15:27.checkXYRoll_aftAdj
a 041118_14:53 ICB/onSupports_17Nov04/QA/041118_14:53.checkXY_aftAdj2
a 041117_09:39 ICB/onSupports_17Nov04/QB/041117_09:39.centerXYRoll
a 041117_12:32 ICB/onSupports_17Nov04/QB/041117_12:32.checkY
a 041117_14:50 ICB/onSupports_17Nov04/QB/041117_14:50.checkXYRoll_aftAdj
a 041117_17:01 ICB/onSupports_17Nov04/QB/041117_17:01.checkY
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a 041118_16:16 ICB/onSupports_17Nov04/QB/041118_16:16.checkXY_aftAdj3
a 041118_16:54 ICB/onSupports_17Nov04/QB/041118_16:54.checkXYRoll_aftAdj3
R 050429_09:27 ICB/afterMTFtesting_28Apr05/QA/050429_09:27.sag
R 050429_12:35 ICB/afterMTFtesting_28Apr05/QA/050429_12:35.checkXY_aveOnly
R 050429_12:53 ICB/afterMTFtesting_28Apr05/QA/050429_12:53.checkXY_onAveAxis
R 050502_15:08 ICB/afterMTFtesting_28Apr05/QA/050502_15:08.checkXY_aftAdj1
R 050503_10:48 ICB/afterMTFtesting_28Apr05/QA/050503_10:48.checkXY_aftAdj2
R 050503_14:02 ICB/afterMTFtesting_28Apr05/QA/050503_14:02.checkXY_aftAdj3
R 050504_08:59 ICB/afterMTFtesting_28Apr05/QA/050504_08:59.checkXY_aftAdj4
R 050504_12:13 ICB/afterMTFtesting_28Apr05/QA/050504_12:13.checkXY_aftAdj5
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R 050429_08:52 ICB/afterMTFtesting_28Apr05/QB/050429_08:52.sag
R 050429_12:21 ICB/afterMTFtesting_28Apr05/QB/050429_12:21.checkXY_aveOnly
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R 050429_13:12 ICB/afterMTFtesting_28Apr05/QB/050429_13:12.checkXY_onAveAxis
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R 050503_11:04 ICB/afterMTFtesting_28Apr05/QB/050503_11:04.checkXY_aftAdj2
R 050503_13:35 ICB/afterMTFtesting_28Apr05/QB/050503_13:35.checkXY_aftAdj3
R 050504_09:26 ICB/afterMTFtesting_28Apr05/QB/050504_09:26.checkXY_aftAdj4
R 050504_12:02 ICB/afterMTFtesting_28Apr05/QB/050504_12:02.checkXY_aftAdj5
R 050504_16:56 ICB/afterMTFtesting_28Apr05/QB/050504_16:56.checkXY_aftAdj6
R 050505_08:46 ICB/afterMTFtesting_28Apr05/QB/050505_08:46.checkXY_onAveAxis
a 050106_16:21 MTF/mounting_06Jan05/QB/050106_16:21.checkXY_aveOnly
a 050107_07:33 MTF/mounting_06Jan05/QB/050107_07:33.checkXY_onAveAxis
a 050107_15:04 MTF/mounting_06Jan05/QB/050107_15:04.checkXY_adj1
a 050110_10:30 MTF/mounting_06Jan05/QB/050110_10:30.checkXY_adj2
a 050106_16:51 MTF/mounting_06Jan05/QA/050106_16:51.checkXY_aveOnly
a 050106_17:03 MTF/mounting_06Jan05/QA/050106_17:03.checkXY_onAveAxis

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a 050107_15:56 MTF/mounting_06Jan05/QA/050107_15:56.checkXY_adj1
a 050110_10:00 MTF/mounting_06Jan05/QA/050110_10:00.checkXY_adj2
R 050120_16:22 MTF/warmBefTC1_20Jan05/QA/050120_16:22.checkXY_aveOnly
R 050120_16:33 MTF/warmBefTC1_20Jan05/QA/050120_16:33.checkXY_onAveAxis
R 050121_09:34 MTF/warmBefTC1_20Jan05/QA/050121_09:34.roll
R 050121_10:35 MTF/warmBefTC1_20Jan05/QA/050121_10:35.checkXY_aftSurvey
R 050120_16:06 MTF/warmBefTC1_20Jan05/QB/050120_16:06.checkXY_aveOnly
R 050120_15:46 MTF/warmBefTC1_20Jan05/QB/050120_15:46
R 050120_16:46 MTF/warmBefTC1_20Jan05/QB/050120_16:46.checkXY_onAveAxis
R 050120_17:01 MTF/warmBefTC1_20Jan05/QB/050120_17:01.roll_repeat/050120_17:02.roll
R 050120_17:01 MTF/warmBefTC1_20Jan05/QB/050120_17:01.roll_repeat/050120_17:24.roll
R 050120_17:01 MTF/warmBefTC1_20Jan05/QB/050120_17:01.roll_repeat/050120_17:47.roll
R 050120_17:01 MTF/warmBefTC1_20Jan05/QB/050120_17:01.roll_repeat
R 050201_13:23 MTF/coldTC1_4.5K_01Feb05/QA/050201_13:23.checkXY_aveOnly
R 050201_15:18 MTF/coldTC1_4.5K_01Feb05/QA/050201_15:18.checkXY_afterSurvey
R 050201_15:58 MTF/coldTC1_4.5K_01Feb05/QA/050201_15:58.checkX_aveOnly
R 050201_16:36 MTF/coldTC1_4.5K_01Feb05/QA/050201_16:36.checkXY_aveAxis_aftSurv
R 050201_13:08 MTF/coldTC1_4.5K_01Feb05/QB/050201_13:08.checkXY_aveOnly
R 050201_16:04 MTF/coldTC1_4.5K_01Feb05/QB/050201_16:04.checkXY_aveOnly
R 050201_16:17 MTF/coldTC1_4.5K_01Feb05/QB/050201_16:17.checkXY_aveAxis_aftSurv
a 050131_15:38 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_15:38.centerXYave
a 050131_15:47 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_15:47.centerXYave
a 050131_16:01 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_16:01.str_669A_up
a 050131_16:16 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_16:16.str_669A_up
a 050131_16:56 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_16:56.str_5460A_up
a 050131_17:41 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_17:41.str_5460A_up
a 050131_19:13 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_19:13.testStr_5460A
a 050131_19:21 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_19:21.testStr_5460A
a 050131_19:25 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_19:25.str_5460A_up
a 050131_19:52 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_19:52.str_11345A_up
a 050131_20:06 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_20:06.str_11345A_up
a 050131_20:19 MTF/coldTC1_1.9K_31Jan05/QAQB/050131_20:19.str_11923A_up
R 050202_14:25 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_14:25.str_669A_up
R 050202_14:35 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_14:35.str_669A_up
R 050202_14:56 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_14:56.roll
R 050202_15:15 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_15:15.str_5460A_up
R 050202_15:53 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_15:53.str_11345A_up
R 050202_16:17 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_16:17.str_11923A_up
R 050202_16:40 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_16:40.str_5460_dn
R 050202_17:09 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_17:09.str_669_up
R 050202_17:37 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_17:37.str_11345_up
R 050202_18:23 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_18:23.str_11345_up
R 050202_18:37 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_18:37.str_11923A_up
R 050202_18:51 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_18:51.str_11923A_up
R 050202_19:03 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_19:03.str_11923A_up
a 050202_19:19 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_19:19.str_11923A_up_2mm
a 050202_19:30 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_19:30.str_11923A_up_2mm
a 050202_19:41 MTF/coldTC1_1.9K_31Jan05/QAQB/050202_19:41.str_11923A_up_2mm
R 050216_12:17 MTF/warmAfterTC1_16Feb05/QA/050216_12:17.checkXY_aveOnly
R 050216_12:30 MTF/warmAfterTC1_16Feb05/QA/050216_12:30.checkXY_onAveAxis
R 050216_17:22 MTF/warmAfterTC1_16Feb05/QA/050216_17:22.checkY_aveOnly
R 050216_17:33 MTF/warmAfterTC1_16Feb05/QA/050216_17:33.checkXY_onAveAxis
R 050218_08:19 MTF/warmAfterTC1_16Feb05/QA/050218_08:19.checkXY_aveOnly_aftSurv
R 050217_15:26 MTF/warmAfterTC1_16Feb05/QA/050217_15:26.roll_repeat/050217_15:26.roll
R 050217_15:26 MTF/warmAfterTC1_16Feb05/QA/050217_15:26.roll_repeat/050217_15:57.roll
R 050217_15:26 MTF/warmAfterTC1_16Feb05/QA/050217_15:26.roll_repeat/050217_16:29.roll
R 050217_15:26 MTF/warmAfterTC1_16Feb05/QA/050217_15:26.roll_repeat
R 050216_12:06 MTF/warmAfterTC1_16Feb05/QB/050216_12:06.checkXY_aveOnly
R 050216_17:14 MTF/warmAfterTC1_16Feb05/QB/050216_17:14.checkY_aveOnly
R 050217_08:02 MTF/warmAfterTC1_16Feb05/QB/050217_08:02.checkXY_aveAxis
R 050217_11:46 MTF/warmAfterTC1_16Feb05/QB/050217_11:46.roll
R 050217_12:05 MTF/warmAfterTC1_16Feb05/QB/050217_12:05.roll
R 050217_12:45 MTF/warmAfterTC1_16Feb05/QB/050217_12:45.roll_repeat/050217_12:45.roll
R 050217_12:45 MTF/warmAfterTC1_16Feb05/QB/050217_12:45.roll_repeat/050217_13:16.roll
R 050217_12:45 MTF/warmAfterTC1_16Feb05/QB/050217_12:45.roll_repeat/050217_13:47.roll
R 050217_12:45 MTF/warmAfterTC1_16Feb05/QB/050217_12:45.roll_repeat
R 050218_08:30 MTF/warmAfterTC1_16Feb05/QB/050218_08:30.checkXY_aveOnly_aftSurv
R 050309_09:05 MTF/warmAfterTC1_16Feb05/QB/050309_09:05.checkX_zpos
R 050309_09:12 MTF/warmAfterTC1_16Feb05/QB/050309_09:12.checkX_zpos
R 050309_09:22 MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos

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R 050309_09:22
MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos_repeat/050309_09:30.checkX_zpos
R 050309_09:22
MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos_repeat/050309_09:36.checkX_zpos
R 050309_09:22
MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos_repeat/050309_09:43.checkX_zpos
R 050309_09:22
MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos_repeat/050309_09:50.checkX_zpos
R 050309_09:22 MTF/warmAfterTC1_16Feb05/QB/050309_09:22.checkX_zpos_repeat
R 050218_09:07 MTF/warmAfterTC1_16Feb05/CORRECTORS/050218_09:07.COR12
R 050218_09:25 MTF/warmAfterTC1_16Feb05/CORRECTORS/050218_09:25.COR12_rotw
R 050218_10:10 MTF/warmAfterTC1_16Feb05/CORRECTORS/050218_10:10.COR34_rotw
R 050218_11:16 MTF/warmAfterTC1_16Feb05/CORRECTORS/050218_11:16.COR34
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Appendix C: Q2A/Q2B->MQXB03/MQXB13

Inside LQXB08, Q2A, closest to the MTF return can, the CDF side of the building, is MQXB03. Q2B, closest to the MTF feed can, away from CDF, is MQXB13.

Appendix D: Calculation of Integral Field Harmonics

Integral field harmonics are computed from the data taken during the longitudinal scan of the magnets as described in earlier reports.

Appendix E: Calculation of Magnetic Length

Magnetic lengths were calculated from rotating coil data only instead of from SSW measurements of the strength and rotating coil measurements of the body field. Details will be provided elsewhere.